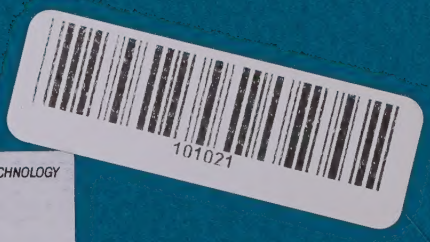
Model # 95236-1
S/N 12089



THE GLOBAL SOURCE FOR PROVEN TEST & MEASUREMENT TECHNOLOGY

TEGAM

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TEGAM, INC.

INSTRUCTION MANUAL
FOR
BULK CURRENT INJECTION PROBE
MODEL 95236-1

SERIAL NO. ~~12088~~ 12089

This document should be inserted into the front of the Model 95242-1 Instruction Manual No. 1-500783-403.

TEGAM, INC.	TITLE DIFFERENCE DATA SHEET CURRENT INJECTION PROBE MODEL 95236-1	DWG NO. 26-101582-001 SHEET 1 OF 5

This document provides additions, deletions and corrections to Model 95242-1 Operations Manual so it may be used as a Model 95236-1 Bulk Current Injection Probe Operations Manual.

Model 95236-1 injection current probe is identical to the Model 95242-1 injection current probe with the exception of the differences given below. Full information on the Model 95242-1 is given in the attached Instruction Manual No. 1-500783-403.

Perform the following changes to the attached Model 95242-1 Instruction Manual:

The Model Number 95242-1 should be replaced with Model Number 95236-1 wherever it appears in the manual.

Page 1-1, paragraph 1.1. Replace the last two of four subparagraphs with one subparagraph:

> "The Model 95236-1 bulk current injection probe is especially designed to provide minimum insertion loss over the 0.1 to 10 MHz frequency range and a useful range from 0.01 to 100 MHz. Because of the high efficiency design, the injection probe can also be used as a very sensitive sensor. Typical transfer impedance data is provided in this manual."

Page 1-2, paragraph 1-2. SPECIFICATIONS. Make the following changes to the specifications:

Change Maximum Input Power:
IS: "200 W (see note)"
SHOULD BE: "100 W (see note)"
Maximum Input Current:
IS: "60A"
SHOULD BE: "30A"
Change Turns Ratio:
IS: "1:1"
SHOULD BE: "1:2"
Change Inductance:
IS: " 0.8 uH, ±20%"
SHOULD BE: "47 uH, ±20%"
Delete self-resonant frequency.
Delete Impedance at resonance.
Change Frequency (MHz) versus Insertion Loss (dB) listing:

IS:

Freq. MHz ..	2	5	10	20	50	100	200	300	350	400
Inser.Loss dB	17	9.5	6.5	6.5	5	5	5	5	5.5	7

SHOULD BE:

Freq. MHz ..	0.01	0.05	0.1	1	10	20	50	100
Inser.Loss dB	34.5	21	15	10	11	11.5	12	15

Change Tolerance Specification:
IS: "+1.5 -2.5 dB"
SHOULD BE: "±4 dB"

Change the Note:

IS: "The power limit of the 95242-1 probe is 200 W. Powers in excess of 100 W should be used with care to avoid excessive temperature in the equipment under test. Prolonged testing should be avoided, particularly if unattended."

SHOULD BE: "The power limit of the 95236-1 probe is 100 W. Powers in excess of 75 W should be used with care to avoid excessive temperature in the equipment under test. Prolonged testing should be avoided, particularly if unattended."

Page 1-3, paragraph 1-3. SUPPORTING EQUIPMENT. Item 1. Model 93686-1 Current Probe. Change the first paragraph accordingly:

IS: "The 93686-1 Current Probe may be used as a bulk current injection probe over the frequency range 50 kHz to 2 MHz. Specifications are:"

SHOULD BE: "The 93686-1 Current Probe may be used as a bulk current injection probe when a larger window size is required or below 20 kHz where its insertion loss may be lower than that for the Model 95236-1. Specifications are:"

Page 2-2. Under Apparatus paragraph, Step 1. The Model 95236-1 injection probe may be used instead of the 93686-1 probe listed.

Page 2-9, Figure 2-5. TYPICAL INSERTION LOSS, MODEL 95242-1. Replace this figure with a revised Figure 2-5 provided at the end of this document (Sheet 5 of 5) entitled "TYPICAL INSERTION LOSS, MODEL 95236-1."

Page 2-10, paragraph 2-3. CONDUCTED EMISSION. Replace the Frequency MHz versus ZT Ohms chart in this paragraph with the following typical chart for the Model 95236-1 Bulk Current Injection Probe.

Frequency MHz	ZT Ohms
0.01	1.0
0.02	2.0
0.05	4.7
0.07	6.3
0.1	8.2
0.2	12.3
0.5	14.9
1.0	15.1
2.0	14.3
5.0	14.0
10.0	13.5
20.0	13.3
30.0	13.0
50.0	12.2
75.0	10.7
100.0	8.7

Page 2-11, paragraph 2-4. INSERTION LOSS. Change the Equipment List to reflect the Model 95236-1 injection probe and lower frequency range:

Signal Generator (50 ohms)	0.01 to 100 MHz
RF Voltmeter (50 ohms)	0.01 to 100 MHz
Calibration Jig	95241-1
50 ohm Termination	VSWR <1.2
Bulk Injection Current Probe	95236-1

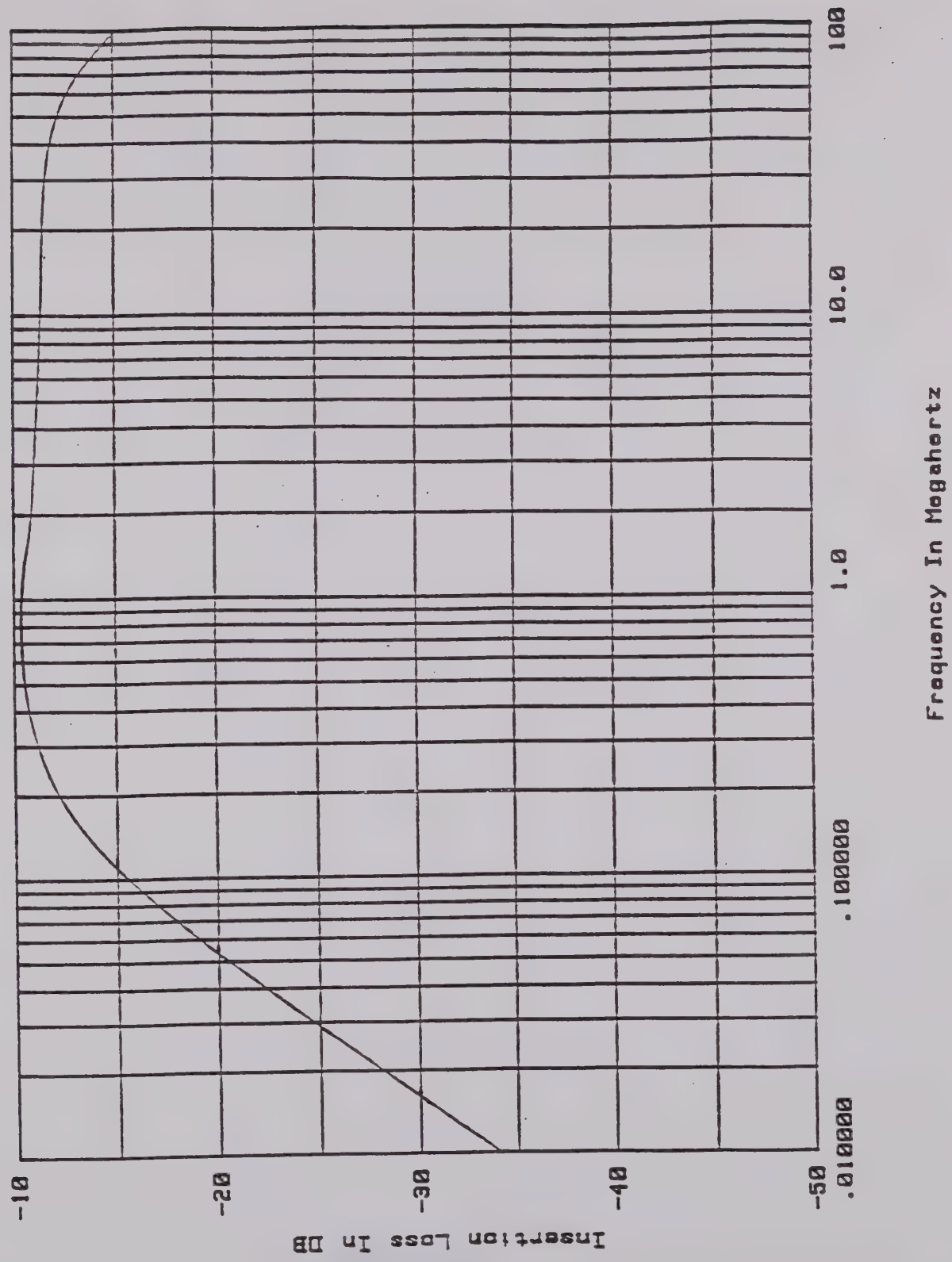

Figure 2-5. TYPICAL INSERTION LOSS, MODEL 95236-1

TEGAM, INC.	TITLE DIFFERENCE DATA SHEET CURRENT INJECTION PROBE MODEL 95236-1	DWG NO. 26-101582-001 SHEET 5 OF 5

OPERATIONS MANUAL
FOR
BULK CURRENT INJECTION PROBE

Model No. 95242-1

Manual No. 1-500783-403

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TEGAM

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WARRANTY

Tegam, Inc. (SELLER) warrants each new instrument to be free from defects in material and workmanship, effective after delivery to the original purchaser as follows:

Electrical and Electronic Measuring Instrument...1 Year

Repair or replacement (at our option) without charge (F.O.B. factory) will be effected when our examination satisfactorily indicates that defects are due to workmanship or materials. Electron tubes, semiconductors, batteries, fuses, lamps, thermoelements, and Ratio Tran potentiometers are excluded from warranty coverage. Warranty returns must first be authorized by the factory.

If the instrument or any portion thereof has been abused, misused, damaged by accident or negligence, or if any serial number or seal has been removed or altered, the warranty is void.

This warranty is in lieu of all other warranties, express or implied INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, or fitness for a particular purpose. In no event shall the SELLER be liable for INCIDENTAL OR CONSEQUENTIAL damages. The SELLER neither assumes, nor authorizes any person to assume for it, any other liability in connection with sales of instruments manufactured by SELLER.

With respect to repairs, the foregoing warranty shall apply for a period of ninety days to the repaired portion.

REPAIRS AND MAINTENANCE

Instruments should be returned only on prior authorization from the representative or the factory. You will be advised of detailed shipping instructions at that time. Return the instrument to the factory prepaid. Validity of warranty shall be determined by the factory.

Chargeable repairs: If requested, an estimate of charges will be made prior to repairs. Please provide us with the following information in order to expedite the processing of your instruments:

1. Model or Type
2. Serial Number
3. Description of trouble*
4. Approximate date instrument was placed in operation.
5. Approximate number of hours in use.
6. Maintenance action previously requested
7. Other comments

* Include data on symptoms, measurements taken, suspected location of trouble, maintenance action taken and any other relevant data.

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SECTION 1

GENERAL INFORMATION

1-1. INTRODUCTION

The Model 95242-1 Bulk Current Injection Probe is used to inject RF current into conductors and cables of electrical and electronic equipment undergoing susceptibility testing.

Direct connection to a conductor is not required. The injection probe with its "clamp-on" feature is simply clamped around the test conductor and becomes a one-turn secondary winding. The injection probe "window" accommodates conductors up to 40 mm in diameter.

The Model 95242-1 Bulk Current Injection Probe is especially designed to provide minimum insertion loss over the 2 MHz to 400 MHz frequency range. Because of the high efficiency design, the injection probe can also be used as a very sensitive sensor. Typical transfer impedance data is provided in this manual.

The basic development of bulk current injection probes was done by ERA Technology Ltd. in the United Kingdom, which resulted in Models ERA 36A and ERA 37A and are used for testing equipment in accordance with R.A.E. Technical Memorandum FS510. Model 95242-1 Bulk Current Injection Probe is electrically equivalent to the ERA 36A and ERA 37A Bulk Current Injection Probes.

1-2. SPECIFICATIONS

Model 95242-1

Frequency range	2 - 400 MHz
Window diameter	40 mm
Outside dimensions	102 mm X 130 mm X 60 mm
Weight	1.60 kg
Fastening	Clip
Input receptacle	Type "N"
Maximum input power	200W (see note)
Maximum input current	60A
Maximum core temperature	80 degrees C
Recommended maximum temperature rise	35 degrees C
Maximum time for continuous rating at full power	30 minutes
Turns ratio	1:1
Inductance	0.8 μH, ±20%
Self-resonant frequency	350 MHz, ±10%
Impedance at resonance:	
unloaded	76 + j0 ohms
95241-1 Calibration Jig	50 + j0 ohms, ±5%

Frequency (MHz)	2	5	10	20	50	100	200	300	350	400
Insertion loss (dB)	17	9.5	6.5	6.5	5	5	5	5	5.5	7

Tolerance +1.5 -2.5 dB

NOTE

The power limit of the 95242-1 probe is 200W. Powers in excess of 100 W should be used with care to avoid excessive temperature in the equipment under test. Prolonged testing should be avoided, particularly if unattended.

1-3. SUPPORTING EQUIPMENT

The following equipment is often required when using the Model 95242-1 to perform susceptibility tests.

1. Model 93686-1 Current Probe

   The 93686-1 Current Probe may be used as a bulk current injection probe over the frequency range 50 kHz to 2 MHz. Specifications are:

Frequency Range	.05 - 10 MHz
Window Diameter	66 mm
Outside Diameter	138 mm
Thickness	54 mm
Fastening	Clip
Input Receptacle	Type "N"
Maximum Input Current	26 A
Maximum Core Temperature	80 degrees C
Recommended Maximum Temperature Rise	35 degrees C
Maximum time for continuous rating at full current	30 minutes
Turns Ratio	11:1

Frequency (MHz)	.05	.1	.2	.4	.7	1	2	5	10
Insertion Loss (dB)	27.8	27.4	27.3	27.1	27	27	27	27	27

2. Model 95241-1 Calibration Jig

   The Model 95241-1 Calibration Jig is made in accordance with ERA Technology Limited drawings C12110, C12111 and C12112. The calibration jig is used in equipment setup for measuring insertion loss of the current injection probe and is essential to equipment setup of some susceptibility test procedures.

3. Current Monitoring Probes

   Suggested monitoring current probes are models 91550-1 (10 kHz to 100 MHz) and 94111-1 (1 MHz to 1 GHz). Models 91550-1 and 94111-1 have a 1.25 inch (32 mm) window size and a transfer impedance of 0.5 to 6 ohms over the 50 kHz to 400 MHz frequency range. Please consult the factory for sizes and sensitivities of other current probes.

4. Model 95236-1 Current Probe

The 95236-1 Current Probe may be used as a Bulk Current Injection Probe over the frequency range 10 kHz to 100 MHz. The specifications are:

Frequency Range..... 10 kHz to 100 MHz

Window Diameter..... 40 mm

Outside Dimensions..... 102 mm x 130 mm x 60 mm thi

Fastening..... Clip

Input Receptacle..... Type "N"

Maximum Input Current..... 20A

Maximum Input Power..... 100W

Maximum Core Temperature..... 80 Degree C.

Recommended Maximum
Core Temperature Rise..... 35 Degree C.

Maximum time for continuous
rating at full power..... 30 minutes

Turns ratio..... 1:2

Weight..... 3.5 pounds

Insertion Loss (typical):

Freq. (MHz)	.01	.05	.1	.2	.5	1.0	10	50	100
Insertion Loss (dB)	34	21	16	12	11	10.5	12	12.5	15

5. Model 95252-1 Current Probe

The Model 95252-1 Current Probe may be used as a Bulk Current Injection Probe over the frequency range 10 MHz to 1000 MHz. The specifications are:

Frequency Range..... 10 kHz to 1000 MHz

Window Diameter..... 40 mm

Outside Dimensions..... 102 mm x 130 mm x 35 mm thick

Fastening..... Clip

Input Receptacle..... Type "N"

Maximum Input Current..... 25A

Maximum Input Power..... 100W

Maximum Core Temperature..... 80 Degree C.

Recommended Maximum
Core Temperature Rise..... 35 Degree C.

Maximum time for continuous
rating at full power..... 15 minutes

Turns ratio..... 1:1

Weight..... 2 pounds

Insertion Loss (typical):

Freq. (MHz)	400	500	600	700	800	900	1000
Insertion Loss (dB)	8	12	9	10	13	18	24

6. Model 95251-1 Calibration Jig:

The 95251-1 Calibration Jig is the same as the 95241-1 Jig listed above except that it has been modified to provide better high frequency characteristics for the Model 95252-1 injection probe.

SECTION 2

APPLICATION

2-1. INTRODUCTION

The principal use of the bulk current injection probe is for inducing relatively large RF currents into the signal and power circuits of equipment under test for conducted susceptibility. A secondary application would be to use the same probe in a more familiar role as a sensor for measuring weak conducted RF currents.

2-2. CONDUCTED SUSCEPTIBILITY

The following information is from the R.A.E. Draft Memorandum FS 510, and is an example of susceptibility testing on power, control and signal leads.

Purpose

The purpose of this test is to confirm that RF signals in the range 50 kHz to 400 MHz, when coupled on to a test sample's interconnecting cable looms and power supply lines, will not cause degradation of performance or malfunction. In addition, it will provide an amplitude/frequency malfunction signature for the system which, when compared with the levels of current on the looms (or cables) due to the effects of onboard and external transmitting sources and measured during clearance to service trials, will assist in the determination of adequate safety margins.

Applicability

Cable looms which connect the test sample to other equipment in the aircraft system (including primary power lines), or interconnecting units of the test sample, are subject to this test. The looms are individual wires to be tested and will be defined in the equipment test plan. Some basic ground rules are:

1. All looms will be tested as a whole, connector by connector. If primary power lines use the same connector as control and signal lines, they should also be included in the test.

2. Primary power lines will be tested individually, injecting and monitoring on each line in turn. (If the power lines are in a loom containing other lines they will have to be separated from the loom for this part of the test).

3. On flight safety critical equipment (including sub-systems responsible for the control and/or initiation of electro-explosive devices), individual wires will be selected for testing, in addition to 1 and 2, if a study of the equipment determines sensitivity of certain wires. The wires must be defined in the equipment test plan.

Test Layout

Figure 2-1 shows the layout for the test.

Apparatus

1. Current Injection Probes: 93686-1 - 50 kHz to 2 MHz
   95242-1 (36A) - 2 MHz to 200 MHz
   95242-1 (37A) - 200 MHz to 400 MHz

2. Calibration Jig 95241-1 for the current injection probes.

3. Current Monitoring Probes 91550-1 and 94111-1 - 50 kHz to 400 MHz.

4. Signal source - 50 kHz to 400 MHz.

5. 200 W power amplifier - 50 kHz to 400 MHz.

   The power amplifier must be capable of supplying the full rated power into the current injection probes (which have a high VSWR) with a harmonic content of less than 10%.

6. Spectrum analyzer or measuring receivers - 50 kHz to 400 MHz.

7. Directional coupler - 50 kHz to 400 MHz (e.g. Amplifier Research DC2000).

Test Method

A wide range of circuit impedances and resonances makes it impractical to define the test limits in terms of current flow in the loom or wire under test. The limits are defined in terms of forward power to the injection probe which gives defined currents in the calibration jig.

The test procedure has two main elements:

1. Calibration of the current probes, which must be done prior to each equipment test or series of consecutive tests.

2. The equipment test.

Calibration Procedure for Injection Probe

The following calibration procedure should be performed prior to the test or series of tests using the same test equipment layout probes used for the test. The injection probe should be installed in the calibration jig as shown in Figure 2-2. The calibration jig will be terminated in a 50-ohm, 50-W RF coaxial load at one end and a 50-ohm spectrum analyzer or RF voltmeter at the other. (See Figure 2-2). A 50-W power attenuator will be required to protect the spectrum analyzer. The VSWR of the terminations at both ends of the calibration jig will be less than 1.2:1 over the frequency range of the test. The injection probe is fed power from the signal source via the power amplifier, and the limits are specified in terms of current induced in the calibration jig. Two levels are used:

1. An accept/reject level up to which the performance of the test sample should not be affected.

2. A test level which is higher than the accept/reject level, up to which the equipment is tested to enable a malfunction signature to be obtained for the line or cable loom under test. The test sample must be capable of being tested to this higher level without permanent damage.

The test signal supplied to the injection probe will be increased until the voltmeter or spectrum analyzer indicates that the accept/reject level of current (See Figure 2-3) is flowing in the calibration jig. The forward power flow to the probe will be recorded. The power should be increased until the test level current shown in Figure 2-3 is reached. Record the forward power flow again. Measurements should be made over the frequency range 50 kHz to 400 MHz and at sufficient intervals to ensure that amplitude variations are less than 1 dB between each measurement point.

The calibration curves will be shown on the test report. The forward powers to the current injection probes which give two levels of current will become the accept/reject level and the test level respectively, for the equipment test.

Equipment Test

1. The equipment test may be applied to whole cable looms or individual conductors. The equipment tested is defined by the equipment test plan. As a minimum requirement, the injection probe will be connected around the complete cable loom and subsequently around any branches of that loom. In all cases, connect the current monitor probe around the complete loom 50 mm from the connector. (See Step 3).

2. Before testing begins, perform the calibration procedure described in Step 1.

3. The current monitor probe, used to measure the current actually induced on the loom or conductor under test, will be fitted around the loom or conductor under test. Place the face of the monitor probe nearest the test sample's connector so it is 50 mm from the connector (See Figure 2-4). If the overall length of the connector and backshell exceeds 50 mm, the monitor probe should be placed as close to the connector's backshell as possible and its position noted in the test report.

4. The current injection probe should be fitted around the loom or conductor under test so that the separation of the adjacent faces of the injection and the current monitor probe is 50 mm. However if the loom is less than 0.5 m then the injection probe should be placed in the center of the loom and the induced current measured 50 mm from each connector's backshell.

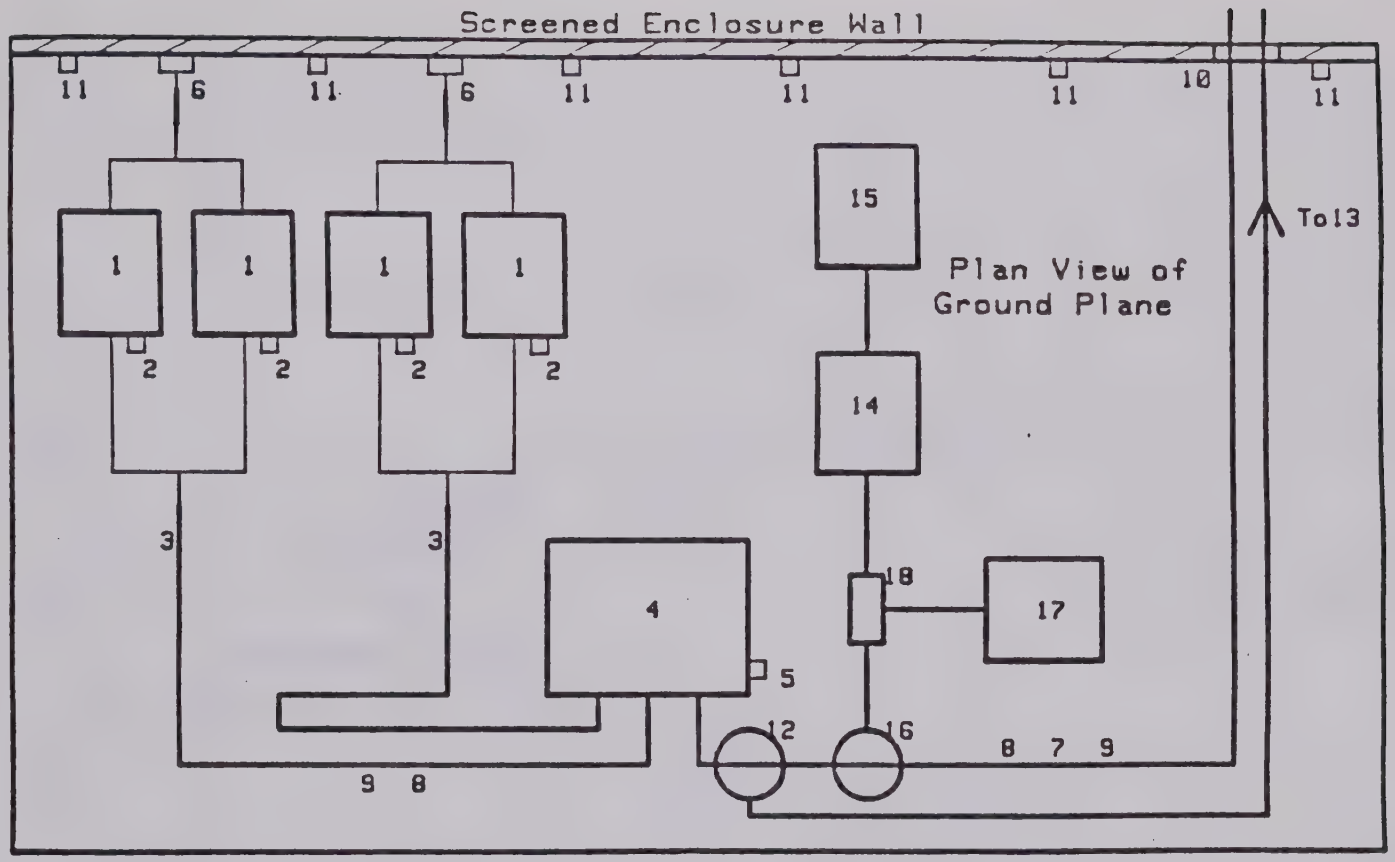
5. At each test frequency, the signal amplitude should be gradually increased from zero until malfunction occurs or the test level is reached. Record two parameters: (a) the

induced current in the loom or wire (50 mm from the connector under test as measured by the monitor probe); and (b) the forward power to the injection probe. The induced current will be used to provide information to the aircraft clearance agency and the forward power will be assessed against the accept/reject level. Complete frequency coverage should be obtained by slowly sweeping between each test frequency to ensure that the lowest susceptibilities have been found and that the full malfunction signature is measured. Care must be taken to ensure that "window effects" (i.e., a malfunction which appears and then disappears with increasing injected power) are not missed. The applied RF injection signal should be modulated.

6. At frequencies where the test sample is susceptible, the signal amplitude should be reduced until a threshold of susceptibility is determined. Check for hysteresis in signal amplitudes by decreasing and then increasing through the susceptibility threshold. The lesser of the two should be recorded.

Low Power Calibration

To verify probe performance, measure the probe at low power (0 dBm) using the calibration jig in Figure 2-2 and the test setup and procedure presented in paragraph 2-4. An automated version of this test setup and procedure may be used. A typical insertion loss graph for the 95242-1 Bulk Current Injection Probe is shown in Figure 2-5. An insertion loss graph for the 95242-1 Bulk Current Injection Probe,Figure 2-8, has been inserted in the back of the manual.



1. LISN and 10uF feedthrough capacitor.
2. Bond to ground plane.
3. Test Sample power leads, 1 metre total length, separated at 30cm from LISN.
4. Test Sample situated with it's face 10 cm +/- 2 cm from front edge of ground plane.
5. Bond to ground plane for Test Sample as defined.
6. Filtered power supply terminals at screened enclosure wall.
7. Test Sample interconnecting lead; length as defined in Test Set-Up and Para 6.4.
8. Power leads and interconnecting leads to be situated 10 cm +/- 2 cm from front edge of ground plane.
9. Power leads and interconnecting leads to be supported 5 cm above ground plane level via insulated stand-offs.
10. Interconnecting lead to monitoring equipment/test set via conduit, feedthrough connectors or filters.
11. Ground plane dc bond to screened enclosure wall shall be less than 2.5 milliohms.
12. Current probe connected to receiver via double shielded or semi-rigid co-axial cable.
13. Receiver. 14. Amplifier 15. Signal Generator 16. Injection Probe. 17. Receiver. 18. Directional Coupler enabling the foreward power to the probe to be measured.

Figure 2-1. TYPICAL TEST CONFIGURATION FOR TEST METHOD ACS 02

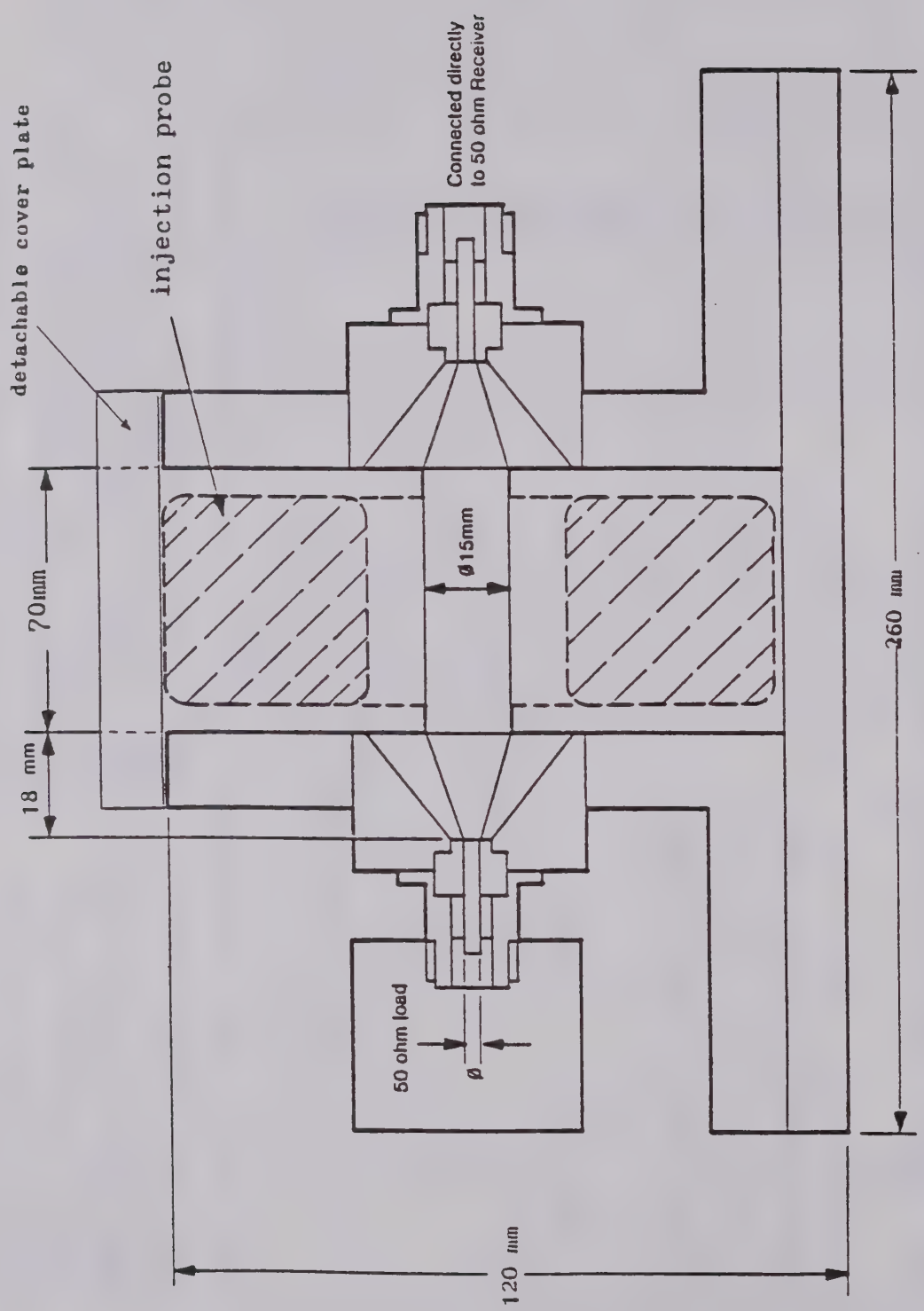


Figure 2-2. TEST CONFIGURATION FOR CALIBRATION OF INJECTION PROBE -- TEST METHOD ACS 02

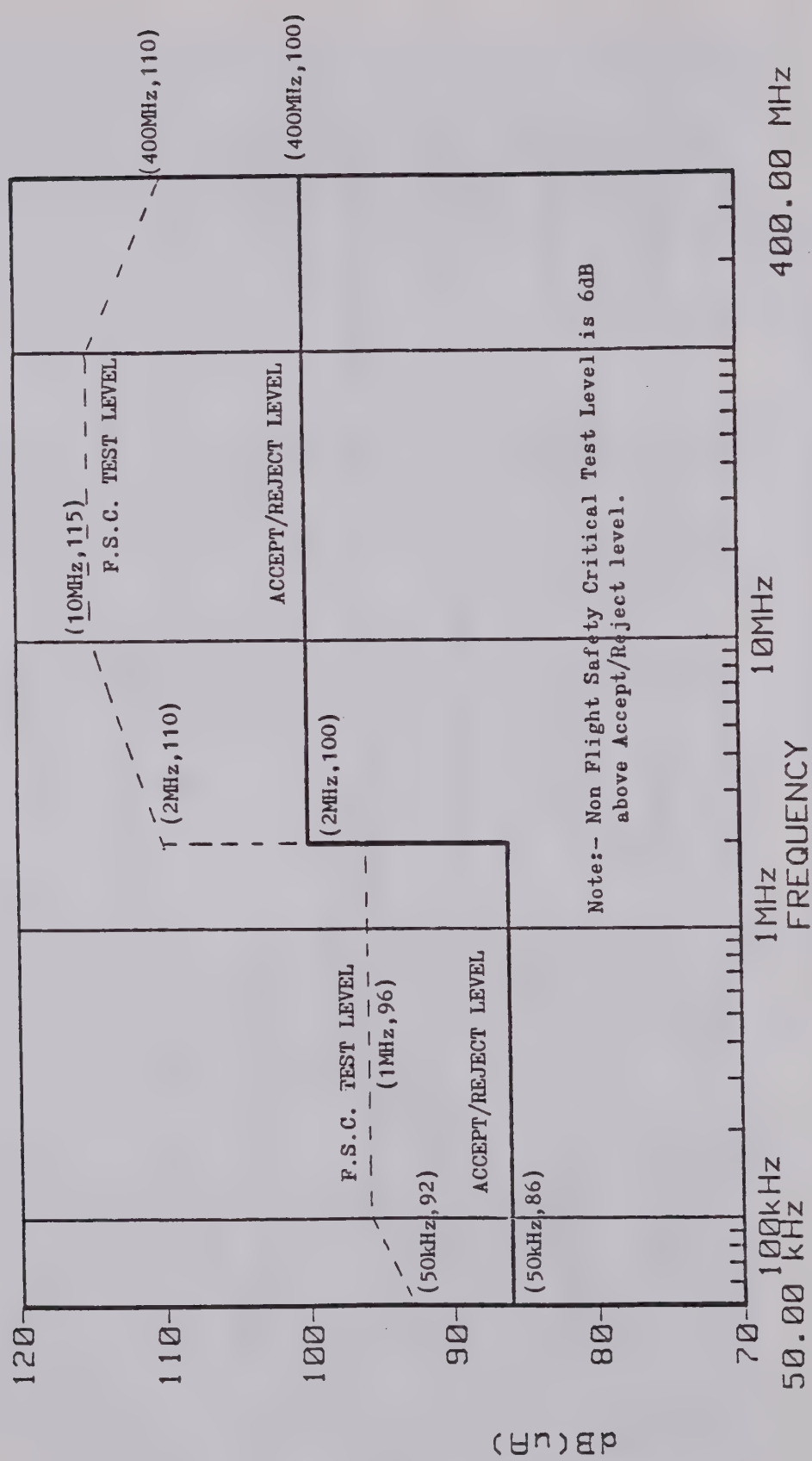


Figure 2-3. LIMITS IN TERMS OF CURRENT THAT MUST BE INDUCED IN THE CALIBRATION JIG

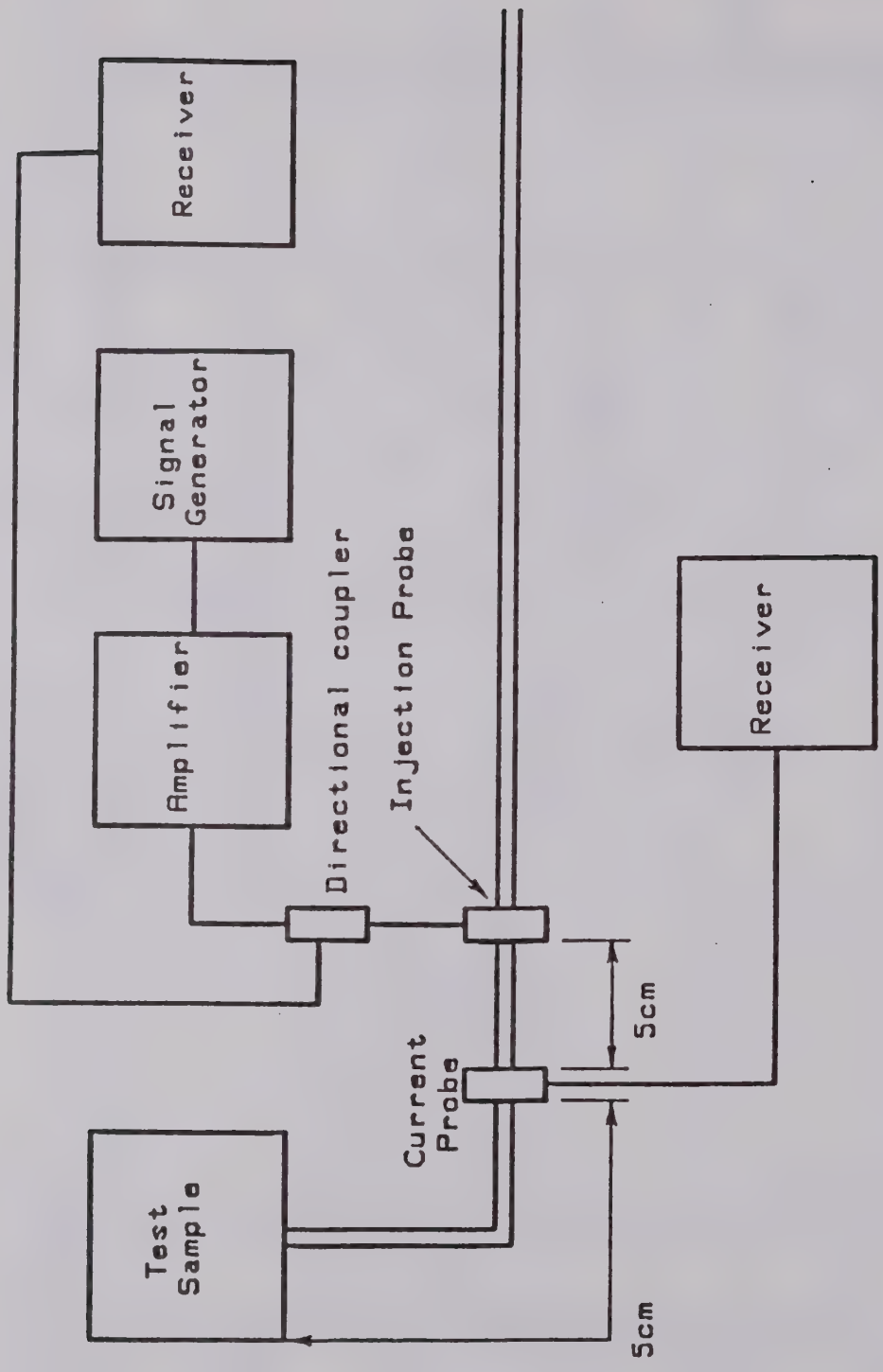


Figure 2-4. TEST LAYOUT ACS 02

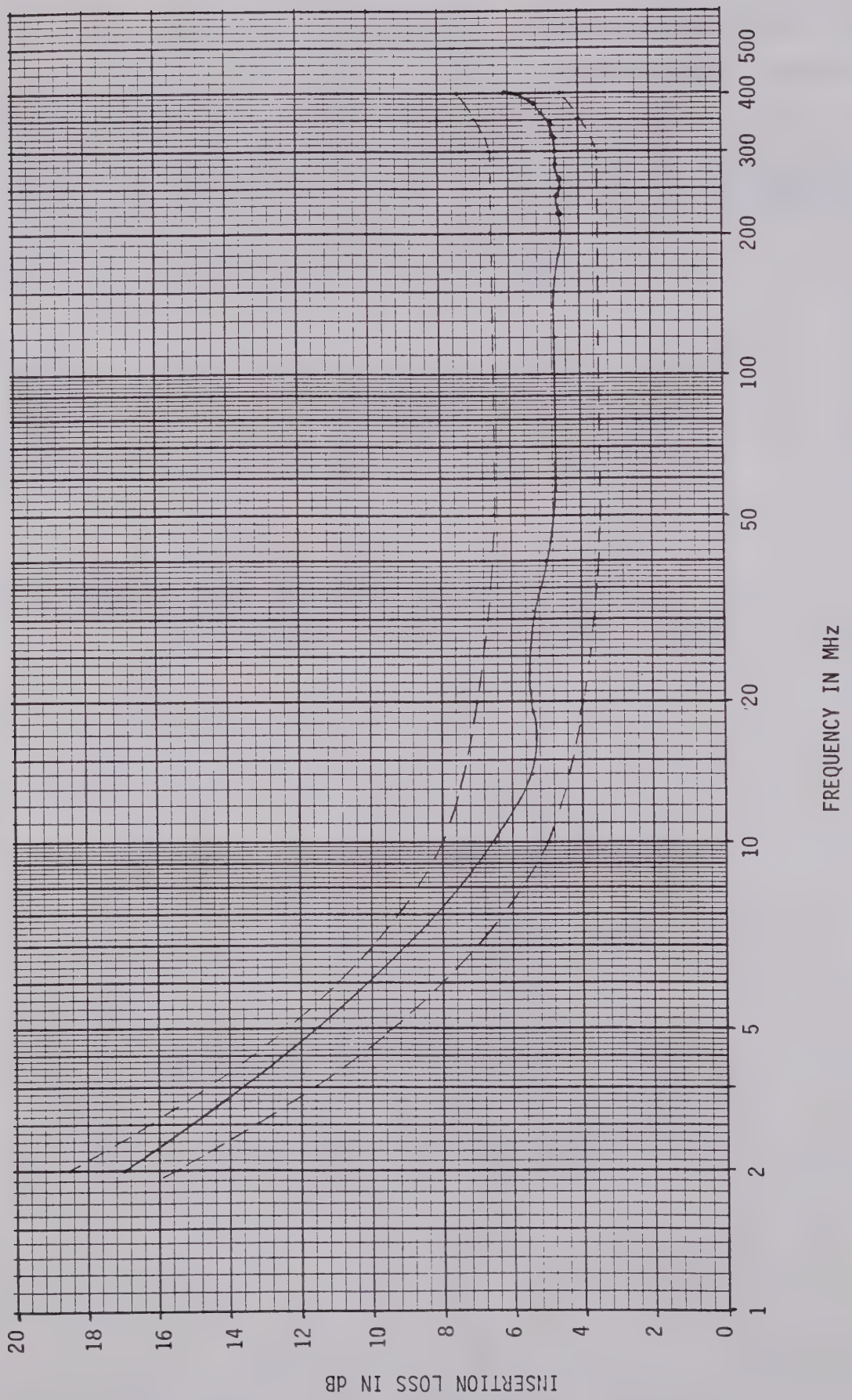


Figure 2-5. TYPICAL INSERTION LOSS, MODEL 95242-1

2-3. CONDUCTED EMISSION

Transfer Impedance (ZT)

The current injection probe may also be used as a sensor for measuring conducted emission. The RF current ((Ip) in microamperes) in the conductor under test is determined from the measuring receiver reading of the probe output (in microvolts (Es)) divided by the probe transfer impedance ((ZT) in ohms).

A transfer impedance graph for the serial number of the 95242-1 Bulk Current Injection Probe received with this manual is shown in Figure 2-7.

$$Ip = \frac{Es}{ZT}$$

The transfer impedance is determined by passing a known RF current (Ip) through the primary test conductor and noting the voltage (Es) developed across a 50-ohm load on the probe output.

$$ZT = \frac{Es}{Ip}$$

Calibration Jig 95241-1 may be used for this determination. Typical transfer impedance values for the Model 95242-1 Bulk Current Injection Probe when used as a sensor are:

Frequency MHz	ZT Ohms
2	7
4	14
6	21
8	26
10	30
15	35
20	37
30	38
40	39
50	39.5
60	40
80	41
100	41
140	42
180	42
220	43
260	43
300	43
320	43.5
340	43.6
360	44
380	42.5
400	39

Frequency MHz	ZT Ohms
420	32
440	25
460	17

High sensitivity and minimal core gap indicate that the current probe should be used only on signal lines where heavy currents are not encountered. Heavy currents may affect measurement accuracy should current probe core saturation occur.

2-4. INSERTION LOSS

Insertion loss of the 94242-1 Bulk Current Injection Probe may be measured at low signal level. The typical insertion loss curve shown in Figure 2-5 was determined using a 50-ohm calibration circuit similar to the following:

Equipment

Signal Generator (50 ohms)	2 to 400 MHz
RF Voltmeter (50 ohm)	2 to 400 MHz
Calibration Jig	95241-1
50-ohm Termination	VSWR <1.2
Bulk Injection Current Probe	95242-1

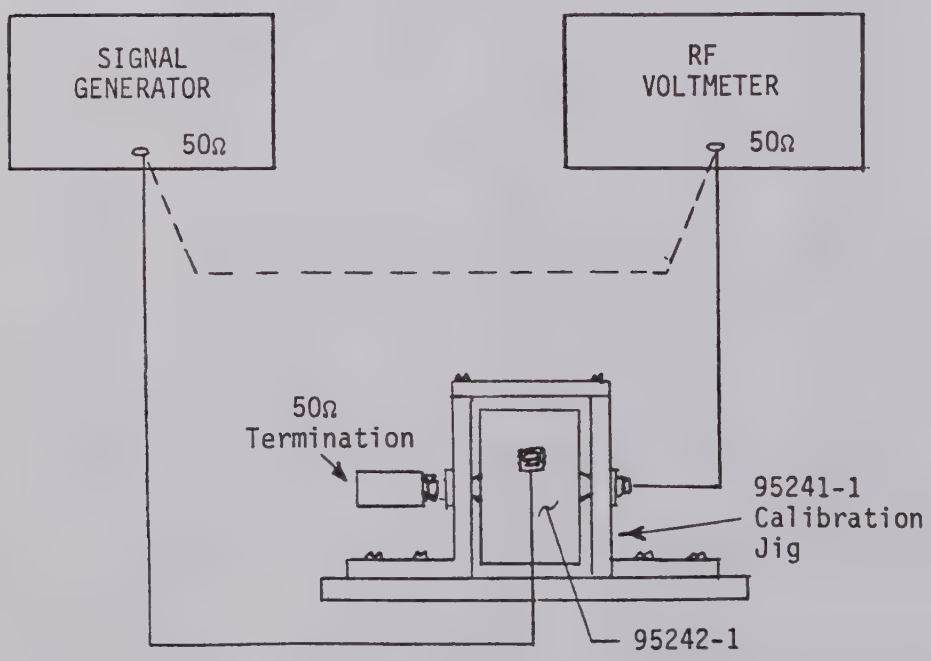


Figure 2-6. EQUIPMENT SETUP

Procedure

1. Connect the signal generator output directly to the RF voltmeter input as shown in Figure 2-6, indicated by the dashed line, using the same cables which connected the calibration jig and the injection probe under test. Tune to the test frequency and adjust the signal level for a reference of 0 dBm indication on the RF voltmeter.

2. Without changing control settings, connect the signal generator output to the bulk current injection probe input, and connect the 95241-1 Calibration Jig connector to the RF voltmeter input.

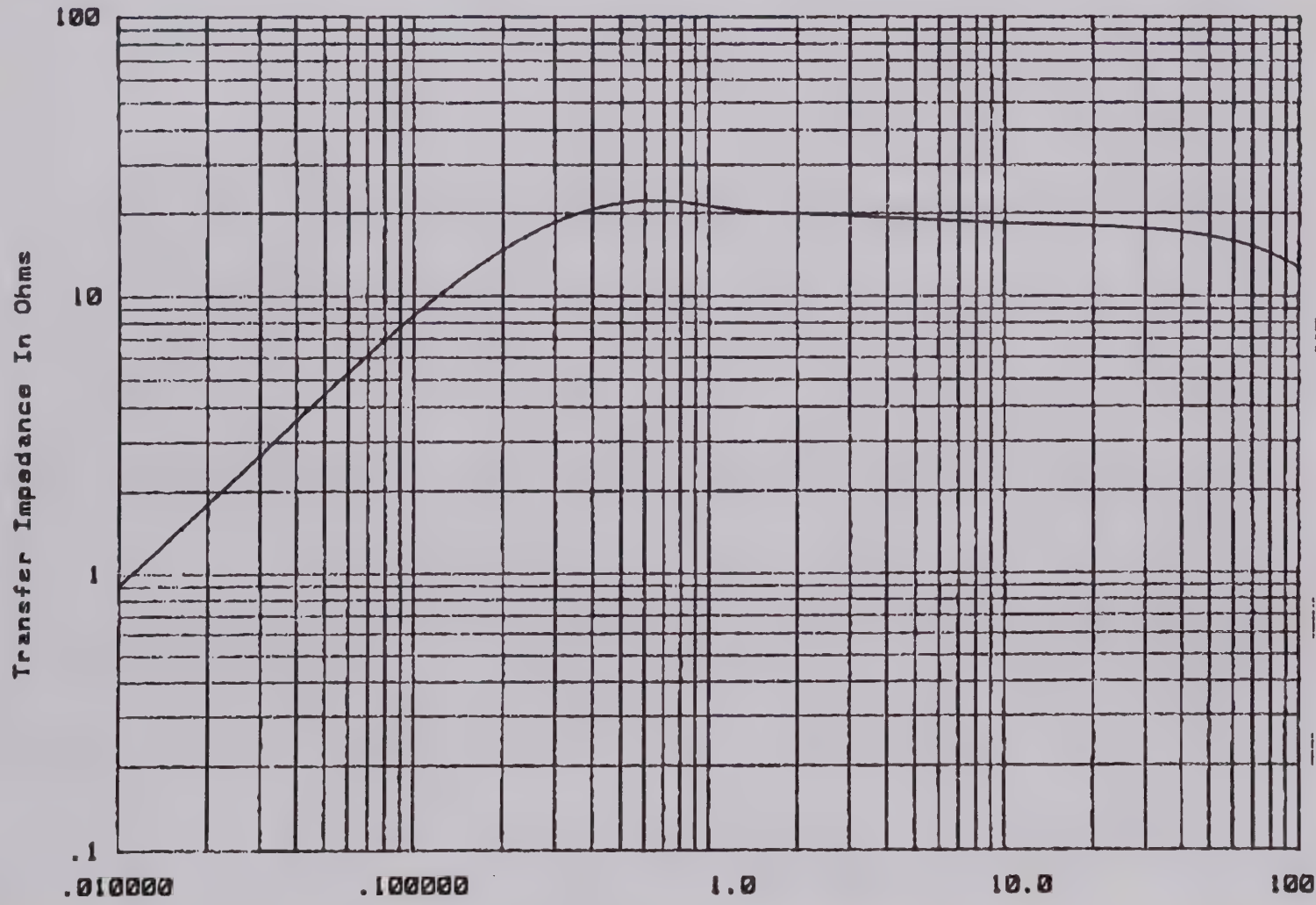
3. Note the RF voltmeter output in dB. The difference between this reading and 0 dB is the insertion loss. In this measurement, the loss can not be less than 3 dB since half the injected power is absorbed by the 50-ohm termination that is partially loading (50%) the 95241-1 Calibration Jig.

4. Plot the insertion loss data on the graph for Figure 2-8.

96(THU) 15:50 TEGAM INC. TEL:216-466-6110 APR 18 '96 01:51PM

Calibration Engineer: ERIC BOWSER
Date: 18 Jan 1996

Serial No.: 12089
Model Type: 95236-1



Post-it® Fax Note 7671 Date 4-18 # of pages ▶ 3
To Bruce Beyer From Lisa Dake
Co./Dept. Co. TEGAM
Phone # Phone #

FIGURE 7

16(THU) 15:50 TEGAM INC. TEL:216-466-6110 APR 18 '96 01:51PM

Calibration Engineer: ERIC BOWSER
Date: 18 Jan 1996

Serial No.: 12089
Model Type: 95236-1

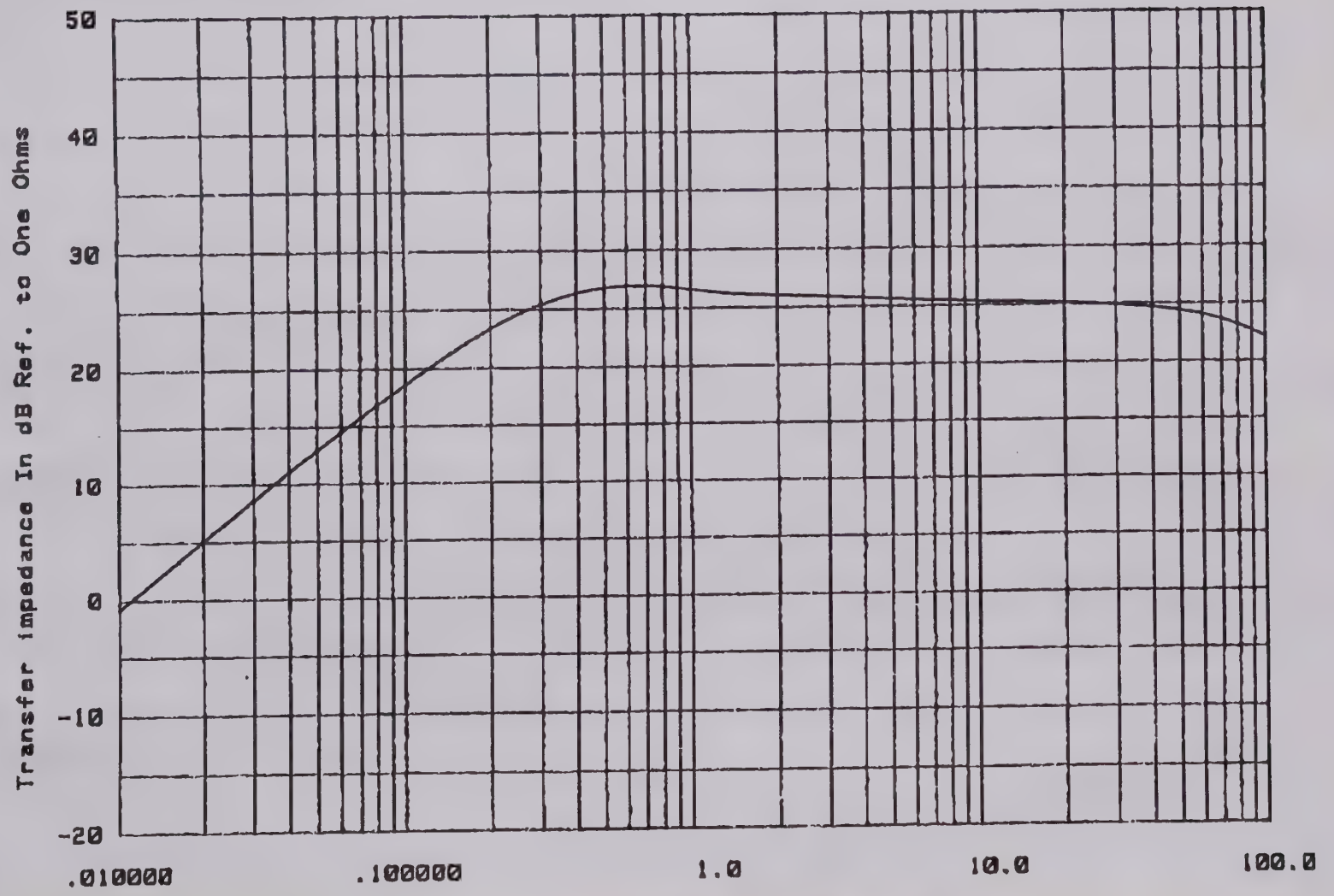


FIGURE 8

96(THU) 15:50 TEGAM INC. TEL:216-466-6110 APR 18 '96 01:51PM

Calibration Engineer: ERIC BOWSER
Date: 18 Jan 1996

Serial No.: 12089
Model Type: 95236-1

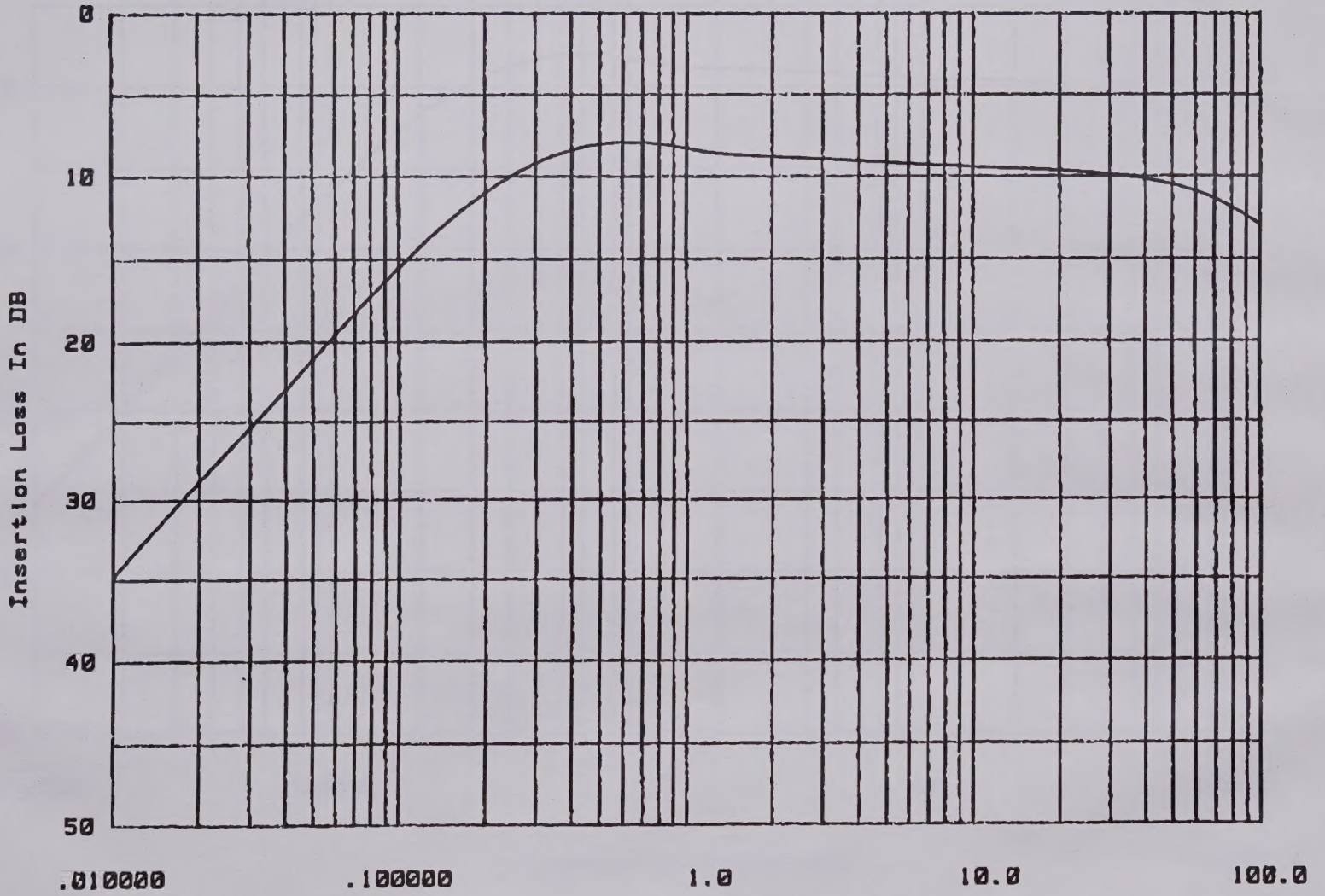


FIGURE 8